

REMARKS

Claims 1, 4, 7 and 8 are pending. Claim 1 has been amended. There is support in the present specification for this amendment as follows:

- (i) the cationic polymerization initiator (C) is a compound that forms cation species as a result of heating so as to initiate the polymerization (support can be found at lines 3-7 on page 15 in the present specification);
- (ii) the epoxy-containing acrylic resin (D) is 1 to 11.1 parts by weight, to 100 parts by weight of the epoxy composition (E) (support can be found in the calculation of the concentration of the epoxy-containing resin (D) in EXAMPLE 6 which includes 50 parts A-2, 40 parts CEL-2021P and 10 parts D-1 which calculates to $10/90 \times 100 = 11.1$ parts by weight of (D) to 100 parts by weight of the epoxy composition (E)); **and**
- (iii) the epoxy-containing acrylic resin (D) includes a polymerization inhibitor (support can be found in Table 1).

No new matter has been added by way of the above-amendment.

I. Rejection under 35 U.S.C. §102

Claims 1, 4, 7 and 8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Takai (US 2003/0059618). Applicants respectfully traverse the rejection.

I-A. Advantages of the Present Invention

An object of the present invention is to provide a thermosetting resin composition that can yield a replacement typically for glass substrates which is excellent in heat resistance, dimensional stability, and optical transparency. In order to further clarify the features of the inventive thermosetting resin composition, claim 1 has been amended. We now discuss the newly added features.

The thermosetting resin composition of the instant claim 1 can be efficiently cured by heating in the presence of ***a cationic polymerization initiator*** which is a compound that forms cation species as a result of heating so as to initiate the polymerization to yield cured articles, as a replacement typically for glass substrates, which are excellent in optical transparency, heat resistance, and dimensional stability.

Applicants respectfully submit that neither the features of the presently claimed invention nor the advantages derived therefrom are taught or fairly suggested by Takai. Applicants now turn to the teachings of Takai.

I-B. Distinctions between the present invention and the teachings of Takai

I-B-i Takai fails to place in the possession of the artisan a composition wherein the concentration of an epoxy-containing acrylic resin (D) is 1 to 11.1 parts by weight to 100 parts by weight of the epoxy composition (E)

Takai fails to anticipate the inventive composition comprising an epoxy-containing acrylic resin (D) in an amount of 1 to 11.1 parts by weight to 100 parts by weight of the epoxy composition (E), as presently claimed.

The Examiner has equated the copolymer (F) of Takai with the epoxy-containing acrylic resin (D) as presently claimed. The Examiner relies on the teachings of paragraph [0036] of Takai for teaching the range 1-50 parts of an epoxy-containing acrylic resin to 100 parts of an epoxy composition.

Applicants note that the relevant exemplified embodiments are shown in Table III-2 at page 18 of Takai. Specifically, Takai teaches "Production Examples 1-3" which are present in amounts of 20, 25, 30, 40 and 50 parts to 100 parts by weight of the epoxy composition. Thus, there is no overlap between the range of 1-11.1 parts, as presently claimed and the amounts of Production Examples 1-3 in the exemplified embodiments of Takai.

Applicants respectfully submit that the Examiner should be analyzing whether Takai anticipates the inventive claim which recites the range of 1-11.1 parts by following the analysis discussed in MPEP 2131.03(II), which is as follows:

II. PRIOR ART WHICH TEACHES A RANGE OVERLAPPING OR TOUCHING THE CLAIMED RANGE ANTICIPATES IF THE PRIOR ART RANGE DISCLOSES THE CLAIMED RANGE WITH "SUFFICIENT SPECIFICITY"

When the prior art discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims,

the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." What constitutes a "sufficient specificity" is fact dependent. If the claims are directed to a narrow range, and the reference teaches a broad range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. See, e.g., *Atofina v. Great Lakes Chem. Corp.*, 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006) wherein the court held that a reference temperature range of 100-500 degrees C did not describe the claimed range of 330-450 degrees C with sufficient specificity to be anticipatory. Further, while there was a slight overlap between the reference's preferred range (150-350 degrees C) and the claimed range, that overlap was not sufficient for anticipation. "[T]he disclosure of a range is no more a disclosure of the end points of the range than it is each of the intermediate points." *Id.* at 1000, 78 USPQ2d at 1424.

Applicants respectfully submit that Takai fails to teach the range of 1-11.1 parts with sufficient specificity to anticipate the present invention. The present facts are similar to the facts discussed above for *Atofina*. Takai teaches examples of 20, 25, 30, 40 and 50 parts, all of which fall far outside the inventive range. Also, the inventive range of 1-11.1 parts makes up only a minor part of the generic range taught by Takai which is 1-50 parts. As such, similar to the findings discussed above for *Atofina*, Applicants respectfully submit that Takai does not anticipate the inventive thermosetting resin composition.

I-B-ii Takai fails to render the present invention obvious

Applicants respectfully submit that Takai does not make the inventive thermosetting resin composition of the instant claim 1 obvious which includes ***a cationic polymerization initiator***. The inventive thermosetting resin composition can be efficiently cured by heating in the presence of ***a cationic polymerization initiator*** which is a compound that forms cation species as a result of heating so as to initiate the polymerization to yield cured articles, as a replacement typically for glass substrates, which are excellent in optical transparency, heat resistance, and dimensional stability.

On the other hand, in Takai, coated test plates were obtained by coating the resin composition on a tin-free steel plate or the like, and pencil hardness, impact resistance, adhesion

and hardness in hot water were evaluated. However, cured articles without a plate such as a replacement typically for glass substrates are not prepared, and no evaluation of heat resistance, dimensional stability and optical transparency, i.e., glass transition point, thermal decomposition temperature, coefficient of cubic expansion and optical transparency was performed.

Takai's resin composition is ultraviolet ray-curable, and used as a coating composition. It is difficult to obtain a cured article without a substrate such as a replacement typically for glass substrates by curing a resin composition with UV irradiation.

This is in distinction to the inventive resin composition which is a thermosetting composition that allows the preparation of cured articles without a substrate, and the cured articles can be used as a plastic plate such as for protection of components, which is excellent in heat resistance, dimensional stability, and optical transparency.

Furthermore, in the thermosetting resin composition of the instant claim 1, the epoxy-containing acrylic resin (D) includes a polymerization inhibitor. Takai does not teach or suggest a polymerization inhibitor.

Therefore, the present invention is not taught or suggested by Takai, and is not obvious from Takai.

I-B-iii The inventive composition has unexpectedly superior properties to the composition of Takai

Applicants respectfully submit, that even assuming *arguendo* that the present invention is *prima facie* obvious over Takai, the examples in the present specification show that the properties of the inventive composition are unexpectedly superior to the properties of the composition of Takai, and as such, are nonobvious.

In the thermosetting resin composition of the instant claim 1, the epoxy-containing acrylic resin (D) is 1 to 11.1 parts by weight to 100 parts by weight of the epoxy composition (E); and the epoxy-containing acrylic resin (D). The compositions falling within this range have unexpected advantages. For instance, each of inventive Examples 4 and 6 falls within this range of the epoxy-containing acrylic resin (D) being 1 to 11.1 parts by weight to 100 parts by weight of the epoxy composition (E) as follows.

EXAMPLE 4: $5/95 = \underline{5.2}$ parts/100 parts,
EXAMPLE 6: $10/90 = \underline{11.1}$ parts/100 parts.

As shown in Table 2 of the present specification (page 30), the inclusion of component (D-2) (prepared by polymerizing an epoxy-containing monomer including compounds each having a glycidyl group or a terminal epoxy group analogous to the glycidyl group) improves the optical transparency of the thermosetting resin composition. For instance, a comparison of Examples 1, 2, 3, 5 and 7 (does not contain component (D-2)) with Examples 4 and 6 (contains component (D-2)), reveals that Examples 4 and 6 obtain better optical transparency, demonstrating the superior results attained from component (D-2).

Specifically, in the inventive Examples 4 and 6, the test pieces were obtained by pouring the resulting thermosetting resin compositions into a Teflon molding form 1 mm deep on a glass plate coated with a mold releasing film, placing another glass plate coated with a mold releasing film thereon, and curing the resin compositions by heating at 50°C for 4 hours and further heating at 180°C for 2 hours. The test pieces had 208°C or 197°C of glass transition point, 219°C or 197°C of thermal decomposition temperature, -1.92% or -2.37% of coefficient of cubic expansion, and 93.1% or 94.0% of optical transparency.

Therefore, even assuming *arguendo* that the present invention is *prima facie* obvious over Takai, the examples in the present specification show that the properties of the inventive composition are unexpectedly superior to the properties of the composition of Takai, and as such, are nonobvious.


In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Esq., Reg. No. 43,575, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.


If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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